



DEPARTMENT OF ENERGY

Office of River Protection

HANFORD SITE

Tank AY-102 Status

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Farms Project*

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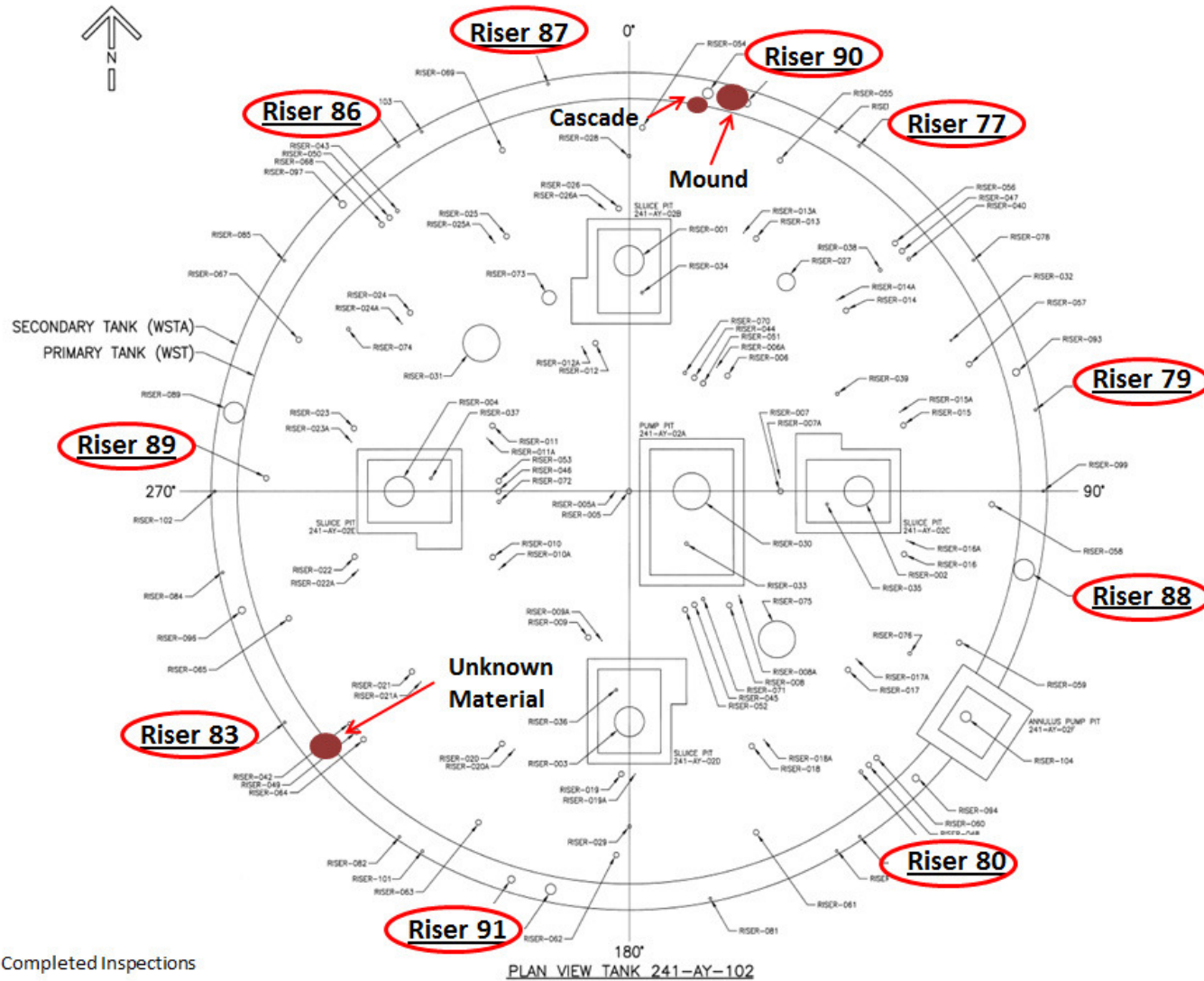
Summary

Routine periodic visual monitoring (via camera) of the AY-102 annulus found material that was never before seen. Inspection of the annulus to date have noted the following:

- Material found in three locations (risers 83 & 90) – source unknown
 - Dark brown mound (approximately 2 ft. x 3 ft. x 8 inches) – riser 90
 - White material on both the refractory (tank sits on refractory) and annulus floor – riser 90
 - Unknown material adjacent to ring – riser 83
- Material is dry (i.e., no standing water or indications of moisture)
- Leak Detection and Continuous Air Monitor (CAM) operable in annulus (real time monitoring)
- Camera equipment removed from annulus without incident (i.e., no contamination on equipment)
- Contamination present when annulus floor sample was taken from riser 90



AY-102 Annulus Inspections



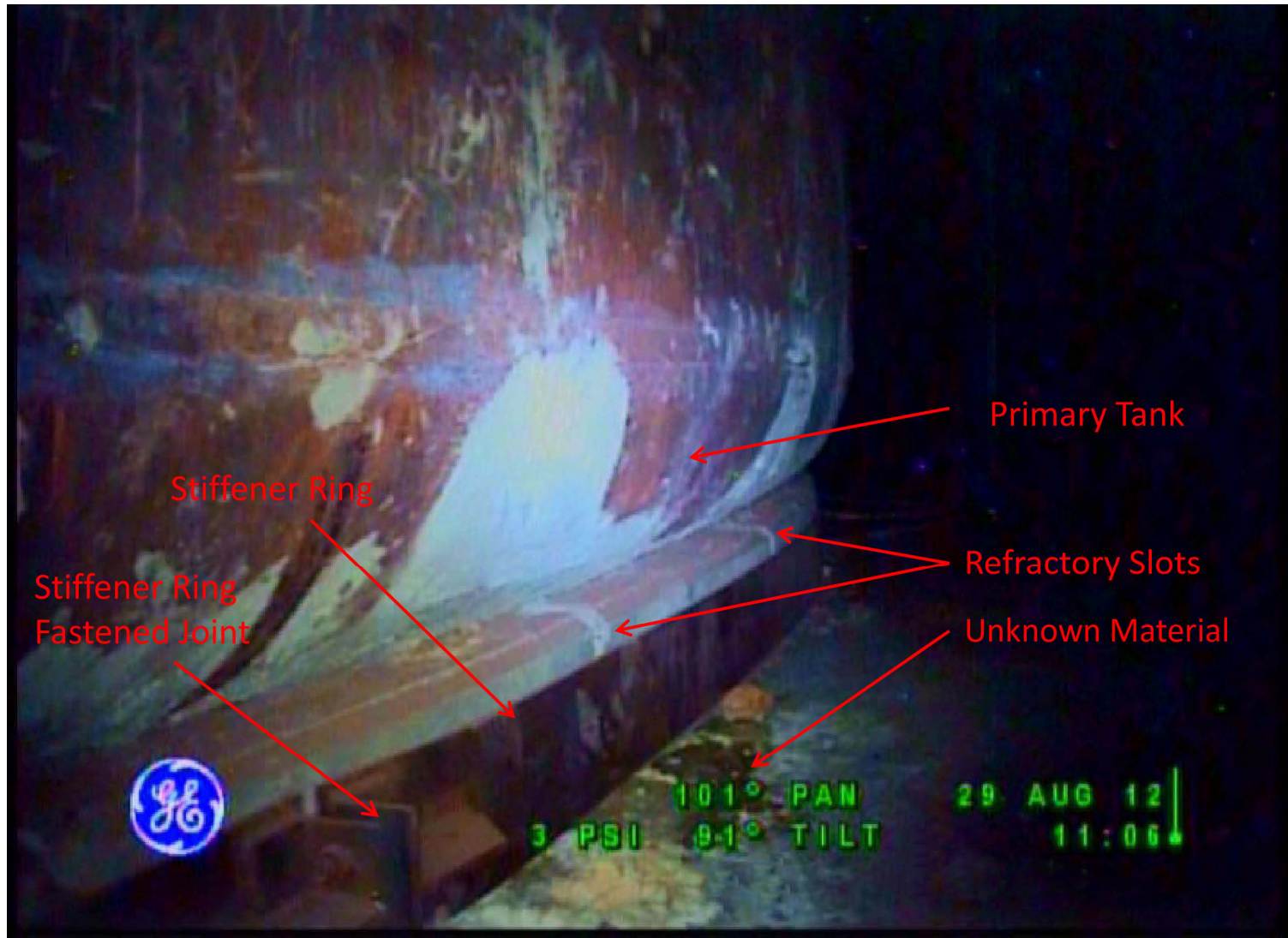


Inspection Photographs from Riser 90 – August 10, 2012





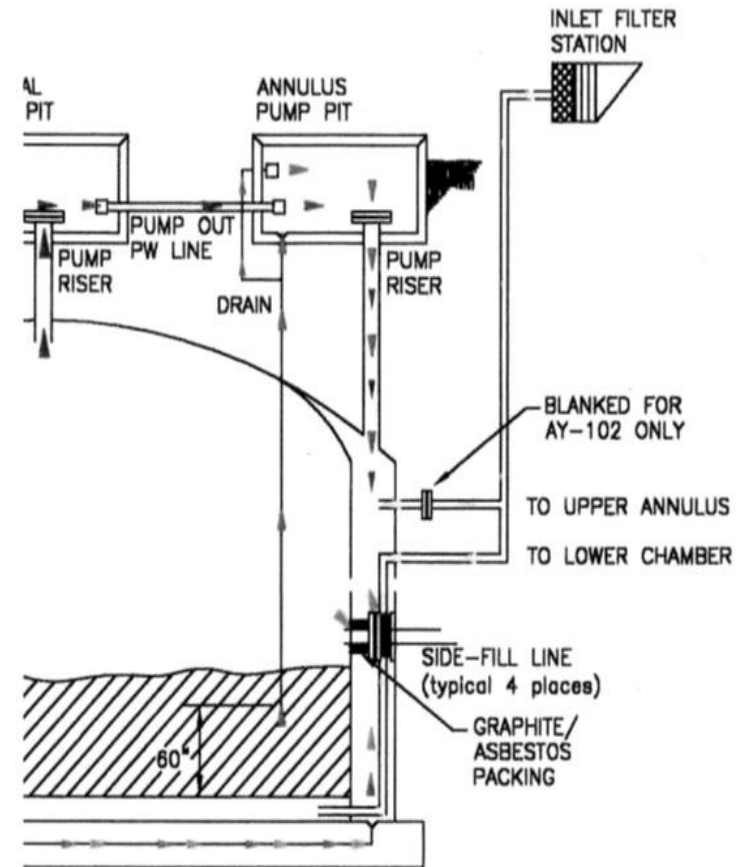
Overview of Region Viewed from Riser 83 – August 29, 2012





AY-102 Background

- Double-Shell Tank (DST) AY-102 built in 1970 and placed into service in 1971 as an aging waste spare tank and received waste in 1977
- Annulus ventilation used to remove tank residual heat
- Liner provides secondary containment of waste
- Primary waste types are B Plant evaporated waste and Sludge from single-shell tank (SST) C-106 Sluicing
- No other Hanford waste tank closely approximates this composition of sludge
 - High H_2 Generation
 - Sludge contains solution low in Nitrate, Nitrite, and $pH < 12$
 - High heat generation
- Current volume 857,000 gallons of sludge and supernatant
- No unexplained primary tank level changes





DST Integrity Monitoring

Two elements make-up the DST Integrity Monitoring Program – Inspections and Tank Waste Chemistry Control

Inspections

- Annulus videos are performed on a nominal 5 year cycle, not to exceed 7 years
 - AY-102 last performed in 2006
 - » No indications of material in annulus
- Ultrasonic (UT) wall thickness testing is performed on the primary tank wall from the annulus on an 8 to 10 year cycle
 - WRPS averages completing 3 to 4 tank UT scans each year
 - AY-102 UT last performed in 2007 (no abnormalities noted)

Tank Waste Chemistry Control

- Corrosion monitoring probes are installed in many DSTs with removal and analysis of the probe every 3 years
 - AY-102 corrosion probe installed in 2009
- Tank waste samples are taken on a nominal 5 year cycle for chemistry control, or more frequently when transfers are being made into or out of a tank (e.g., SST retrievals)



Ongoing Investigatory Actions

Action	Status
<ul style="list-style-type: none">• Initiate camera installation in Riser 90<ul style="list-style-type: none">– Monitoring twice per week per monitoring plan	COMPLETE
<ul style="list-style-type: none">• Increased level monitoring of Annulus<ul style="list-style-type: none">– Monitor each Shift	COMPLETE
<ul style="list-style-type: none">• Perform bi-weekly monitoring of CAM	COMPLETE
<ul style="list-style-type: none">• Initiate activities to obtain samples of materials<ul style="list-style-type: none">– Data Quality Objective (DQO) and Sample Plan under development– Obtain annulus samples mid to late September (on schedule)	IN PROGRESS
<ul style="list-style-type: none">• Initiate Tank Assessment Process<ul style="list-style-type: none">– Use Tank Leak Assessment Process– Complete assessment about 1 week after sample results are reported	IN PROGRESS
<ul style="list-style-type: none">• Document near term and long term actions in Engineering Path Forward	IN PROGRESS



Near Term Actions

- **Initiate tank annulus inspection (accessible areas)**
 - Develop list of accessible risers – Complete
 - Develop Work Package and Inspection Criteria – Complete
 - Annulus inspection initiated week of August 27, 2012 – Complete
 - Inspection scheduled for completion mid-September
- **Develop contingency plan to transfer AY-102 contents**
 - Developing transfer procedure – In Progress
 - Developing work packages to verify transfer system components are operational (motors, valves, piping) – In Progress
 - Task Ready to Transfer – draft schedules prepared
- **Sample & pump tertiary leak detection pit (Confirms secondary liner integrity)**
 - Review procedure and issue sample request – Complete
 - Ready to sample by September 7
 - Prepare to pump contents by mid-September



Long Term Actions

- **Determine Extent of Condition (i.e., applicability to other tanks)**
 - Developing list of tanks for accelerated inspection (up to 7 tanks)
 - » Similar tank construction and operating history
 - » Similar process history
- **Initiate planning to inspect ventilation piping and adjacent ventilation slots to assess cause**
 - Determining feasibility to perform inspection of ventilation piping
 - Developing work package to inspect ventilation slots
 - » Evaluating ability to perform concurrent with annulus inspection
- **Explore means for removing material from annulus**
 - Initiated discussions with robotic crawler vendors



Conclusion

- Tank is stable with enhanced monitoring in place
- Investigation in progress to determine source of dried solids on floor of annulus and material condition of tank components
- Extent of Condition Evaluation initiated
- Actions underway to mitigate hazard should conditions within the annulus change
- Tank Waste mission essential to mitigate risk associated with aging waste tanks